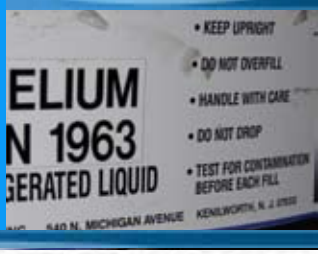
What is this?

The newest of the Magnet Lab's three helium recovery bags. The bags are one step in the process of re-cooling "used" liquid helium from the magnets for later use.

Helium is moved around the building in these giant metal containers, called dewars.

This helium liquefier is one of three used at the Magnet Lab.



We've all held onto a helium balloon and felt helium's differences from the air around us – both its lightness and the speed at which it dissipates, invisible, if a balloon is popped or opened.

Take that same helium and cool it all the way down past 4.2 Kelvin. That's -451.44 degrees Fahrenheit – about twice as cold as spending the night on the moon without a spacesuit, and three and a half times colder than the coldest recorded naturally occurring temperature on Earth.

Eventually the helium is cooled all the way down to around 2 Kelvin, the temperature needed to operate the lab's cold-hungry magnets. At this supercool temperature, helium becomes a liquid with no viscosity – meaning that theoretically, it can flow forever without stopping.

Without liquid helium, the most powerful superconducting magnets here at the lab would work about as well as your body without blood. Helium keeps superconducting and hybrid magnets cool enough to handle high magnetic fields, helping energy to move through the magnet without resistance or outside electricity. Without this simple ingredient, running these powerful research magnets simply wouldn't be possible.

Buying and storing this resource doesn't come cheap; the lab's annual bill for liquid helium alone can reach $1 million. That's why the lab has adapted a system to recycle as much of the helium as possible, a move that's both eco-friendly and cost-effective, and that's where the giant balloon pictured comes in.

That giant balloon is one of the lab's three helium recovery bags (and yes, they're all that big). The bags are basically high-tech recycling bins for helium ready to be re-cooled. Each one of these bags holds about 2,700 cubic feet of helium in gas form. From that huge space, the lab squeezes the gas into about a hundred liters of liquid helium – only enough to fill around 26 one-gallon milk jugs.

DIG DEEPER

Want to know more about liquid helium?
Visit: http://www.magnet.fsu.edu/education/tutorials/magnetacademy/cryogenics/index.html